

## DEPARTMENT OF COMPUTER SCIENCE & TECHNOLOGY

*"T3 Examination, May-2018"*

**Semester:** IV

**Subject:** OPERATING SYSTEMS

**Branch:** CSE / IT

**Course Type:** DOMAIN CORE

**Time:** 3 Hours

**Max.Marks:** 80

**Date of Exam:** 23/05/2018

**Subject Code:** CSH211-T

**Session:** II

**Course Nature:** HARD

**Program:** B.Tech

**Signature:** HOD/Associate HOD:

*Note: All questions are compulsory from Part A (2\*10=20 marks). Attempt any two Questions from Part B (Each Question carries 15 marks). Attempt any two Questions from Part C (Each Question carries 15 marks).*

### **PART-A** (Each Question carries 2 marks)

Q1. Short Answer Type questions:

(a) Differentiate between:

- i. Internal fragmentation & External fragmentation
- ii. Virtual Address & Physical Address
- iii. Synchronous I/O & Asynchronous I/O
- iv. Sequential access & Indexed Sequential access of file
- v. Program Threats & System Threats

(b) What are the advantages of contiguous allocation of disk space?

(c) What is Demand Paging?

(d) Name most common schemes for defining the logical structure of a directory.

(e) What is a lock-key mechanism?

(f) What is Distributed File System?

### **PART-B** (Attempt any two Questions. Each Question carries 15 marks)

Q2. a) Given five memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB (in order), show how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)? Which algorithm makes the most efficient use of the memory? **[(2\*3)+1=7]**

b) What is a page fault error? Explain the steps in handling a page fault error.

**[2+2=4]**

c) What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem? **[1+2+1=4]**

Q3. a) On a system using simple segmentation, compute the physical address for each of the logical addresses, given the following segment table. If the address generates a segment fault, indicate so. [5]

| Segment | Base | Length |
|---------|------|--------|
| 0       | 330  | 124    |
| 1       | 876  | 211    |
| 2       | 111  | 99     |
| 3       | 498  | 302    |

(a) 0, 999

(b) 2,78

(c) 1, 265

(d) 3, 222

(e) 0, 111

b) Discuss stateful versus stateless service in distributed file system? [4]

c) Compare the different file access mechanisms. [2\*3=6]

Q4. Given reference to the following pages by a program:

**0,9,0,1,8,1,8,7,8,7,1,2,8,2,7,8,2,3,8,3**

Find how many page faults will occur if the program has three page frames available to it and uses: [5\*3=15]

(a) FIFO replacement

(b) LRU replacement

(c) Optimal replacement

**PART-C** (Attempt any two Questions. Each Question carries 15 marks)

Q5. Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is **86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130**

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk-scheduling algorithms? [5\*3=15]

a) FCFS      b) SSTF      c) SCAN

Q6. a) What is the significance of DMA transfer? Discuss steps of DMA transfer? [2.5+2.5]

b) What are STREAMS? Describe the STREAMS structure diagrammatically. [2.5+2.5]

c) Discuss two standard security attacks. [5]

Q7. a) What is the need-to-know principle? Why is it important for a protection system to adhere to this principle? [2.5+2.5]

b) Write short notes on: [2\*5=10]

- i. Language based protection
- ii. Denial of Service
- iii. RAID
- iv. Cryptography as a security tool
- v. Intrusion Detection

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